BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN ECOLOGY - QUANTITATIVE REASONING CATEGORY III/IV AND STRETCH ENGLISH

120 Total Units Required
Minimum Number of Units in the Major: 67

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

Course	Title	Units
First Semester		
BIOL 230	Introductory Biology I (Major Lower-Division Core)	5
ENG 104	Writing the First Year: Finding Your Voice Stretch I [1]	3
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) [2,3]	3
GE Area A [4]		3
GE Area C		3
	Units	17
Second Semester		
CHEM 115	General Chemistry I: Essential Concepts of Chemistry (Major Lower-Division Core)	5
ENG 105	Writing the First Year: Finding Your Voice Stretch II (A2) [1]	3
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, B4) [2,3]	3
PHYS 111 & PHYS 112	General Physics I and General Physics I Laboratory (Major Lower-Division Core, B1, B3)	4
	Units	15
Third Semester		
BIOL 240	Introductory Biology II (Major Lower-Division Core) [5]	5
MATH 226	Calculus I (Major Lower-Division Core, B4) [2,3]	4
GE Area D		3
GE Area E		3
	Units	15
Fourth Semester		
CHEM 130	General Organic Chemistry (Major Lower-Division Core) [6]	3
Select Two (Major Lower-Division Core):		8-9
CHEM 215 & CHEM 216	General Chemistry II: Quantitative Applications of Chemistry Concepts and General Chemistry II Laboratory: Quantitative Applications of Chemistry Concepts	
MATH 227	Calculus II	
PHYS 121 & PHYS 122	General Physics II and General Physics II Laboratory	
GE Area A		3
	Units	14-15
Fifth Semester		
BIOL 355	Genetics (Major Upper-Division Core) [7]	3
BIOL 458	Biometry (Major Upper-Division Core)	4
GE Area C - Take Two		6
GE Area D		3
	Units	16
Sixth Semester		
BIOL 337	Evolution (Major Upper-Division Core)	3
BIOL 525 or BIOL 630	Plant Physiology (Major Upper-Division Core) or Animal Physiology	3
Major Upper-Division Electives (11–14 Units Total) - Take One [8]		2-4
GE Area D		3
SF State Studies or University Elective		3
	Units	14-16
Seventh Semester		
Major Upper-Division Electives (11–14 Units Total) - Take Two to Three [8]		8
Major Upper-Division Requirement (6–8 Units Total) - Take One [9]		4
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)		3
	Units	15
Eighth Semester		
Major Upper-Division Electives (11–14 Units Total) - Take One [8]		2-4
Major Upper-Division Requirement (6–8 Units Total) - Take One to Two [9]		4-6

GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)	3
SF State Studies or University Elective - Take Two	5
Units	14-18
Total Units	120-127

1 ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

2 Depending on courses completed through Early Start, students in Pathway/Category III or IV may be required to enroll in a support course to complement their Quantitative Reasoning/B4 requirement. There are multiple course options for this pathway. Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (http://cms.sfsu.edu/content/student-center/). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (http://developmentalstudies.sfsu.edu/).

3 QR Category III students with a grade of B or higher in high school pre-calculus in the past year may be able to enroll in MATH 226. Please see a department advisor.

4 To avoid taking additional units, it is recommended that you meet **SF State Studies** requirements (AERM, GP, ES, SJ) within your GE.

5 GE Areas B2 (Life Science) and B3 (Laboratory Science) are satisfied upon completion of BIOL 240.

6 GE Area B1 (Physical Science) is satisfied upon completion of CHEM 130.

7 Upper-Division General Education, Physical, and Life Sciences (UD-B) is satisfied upon completion of BIOL 355.

8 **Major Upper-Division Electives (11-14 units)**
Select 11-14 units upon advisement from the alternates not used in fulfilling the requirements listed above, or any other upper-division Biology courses not specifically excluded for major credit, or any graduate course in Biology.

9 **Major Upper-Division Requirement (6-8 units)**
Select 6-8 units on advisement from the following:
BIOL 482 Ecology (4 units)
BIOL 490 Ecology of Infectious Diseases (4 units)
BIOL 529GW Plant Ecology - GWAR (4 units)*
BIOL 530 Conservation Biology (3 units)
BIOL 532 Restoration Ecology (3 units)
BIOL 534 Wetland Ecology (4 units)
BIOL 577 Ecological and Environmental Modeling (4 units)
BIOL 580 Limnology (3 units)
BIOL 582 Biological Oceanography (4 units)
BIOL 585 Marine Ecology (3 units)
BIOL 586 Marine Ecology Laboratory (2 units)

* Students are required to complete at least one GWAR course in order to graduate.